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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/002,788

11/02/2001

Rafael Yuste

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01/05/2007

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EXAMINER

BARTLEY, KENNETH

ART UNIT

PAPER NUMBER

3693

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/002,788

Applicant(s)

YUSTE ET AL.

Examiner

Kenneth L. Bartley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/01/2002.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-40 have been examined.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: references 913 and 915 cited in para. 51. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Fig. 3 and Fig. 9 are difficult to read. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: 1) the phrase "where events" is repeated in para. 6; 2) the word "that" appears to be missing in the sentence "... the same counting methodology was used to count..." in para. 36.

Appropriate correction is required.

5. Claim 31 is objected to because of the following informalities: it references the "method of claim 23," whereas claim 23 is a system. Appropriate correction is required.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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7. Claims 1-17, 20-37 and 40 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 6-22, 26-39 of U.S. Patent No. 6,823,286 to Yuste, et al., in view of U.S. Patent No. 5,846,189 to Pincus.

8. Regarding applicant claims 1-17, 20-37 and 40, Yuste, et al., provides methods and systems for analyzing relationships between data for tissue slice images or gene expression using correlation analysis, Markov, or singular valued decomposition. Pincus also discloses an invention for analyzing relationships between data using a methodology described as "approximate entropy" that is applicable to various areas including medical, financial, engineering, etc. (col. 2, lines 33-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention that analyzing relationships between data could be applied to financial analysis motivated by the need for efficient and accurate investment analysis, which, for example, could be used to enhance investor returns.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-5, 8-10, 21-25, 28, 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,784,696 to Melnikoff.

11. Regarding applicant claims 1, 5, 9, 10, 21, 25, 29 and 30, Melnikoff discloses:

- a. Methods and apparatus for risk analysis that can be applied to all types of investments traded on a financial market (col. 7, lines 29-35);
- b. Arrangement of data in a two-dimensional array (Fig. 2 and Fig. 8A). While Melnikoff discloses indexing one of the arrays (col. 19, lines 31-43), he does not disclose indexing both arrays. However, Melnikoff would be capable of indexing such arrays, and in fact would be required if the processing occurred, as stated, in parallel (col. 16, lines 29-32 and col. 9, lines 46-60);
- c. Detecting a shortfall (asset underperforms a second asset at same time period) and records the difference if the number is positive, otherwise, a negative number is replaced with a zero over time periods (col. 3, lines 38-45);
- d. Events are stored in the array, where 0 represents zero and negative values and non-zero numbers represent positive numbers (Fig. 1, ref. 22 and 24 for storage devices and Fig. 6c, col. 8 as an example of an "event" where a fund value is compared to a 3 Month T-Bill). By definition, computers store data in binary format;
- e. Correlation analysis can be performed on financial instruments to determine relationships between events of interest (col. 19, lines 16-46);
- f. That a zero is set for a non-event and a non-zero is set for an event (e.g. Fig. 6c, col. 8). A non-zero is commonly used for a Boolean value to equal true,

and a "logical" one indicates Boolean algebra. (Microsoft Computer Dictionary, Fifth Edition, Redmond Wa., 2002, pg. 67 and 317).

12. Regarding claims 2 and 22, Melnikoff discloses use of end-of-month data for a plurality of months (col. 11, lines 23-27). While data used is "indexed," such indexed value is based on price data, therefore, it would have been possible to use price data instead of index data.

13. Regarding claims 3 and 23, Melnikoff discloses a plurality of mutual funds displayed as columns and time arranged as rows (col. 11, lines 17-30 and Fig. 2).

14. Regarding claims 4 and 24, Melnikoff reveals that Modern Portfolio Theory (MPT) involves calculating a mean and standard deviation from a market index to determine the risk of a security relative the market (so-called "beta" risk) (col. 2, lines 27-45). Further, an object of the invention is to "...provide methods and apparatus that are based on a definition of risk as being the likelihood and extent of underperforming a preestablished standard of return..." (col. 5, lines 31-36) and "...there is a broad flexibility in setting the standard level, which may be set on any basis by the investor." (col. 7, lines 41-43). Therefore, the investor would be capable of using standard deviations from an average using MPT as an example.

15. Regarding claim 8 and 28, Melnikoff discloses 84 months to determine shortfall periods (col. 17, lines 16-35) and where it is "particularly preferable to make a significant number of observations of the performance of the investment, on a consistent basis, since the only way to measure investment risk is on a probabilistic basis." (col. 8, lines 58-61).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claims 6, 7, 12, 14, 20, 26, 27, 32, 34 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,784,696 to Melnikoff in view of U.S. Patent 5,846,189 to Pincus.

19. Regarding claims 6, 7, 12, 14, 20, 26, 27, 32, 34 and 40, while Melnikoff provides analysis between two financial instruments at the same time period and the treatment of events, he does not provide analysis for the same financial instrument at different times. However, Pincus provides both auto and cross-analysis of financial instruments and an auto-correlogram. Specifically, Pincus provides:

- a. A way to quantify patternness of a set of data, which includes stock market data (col. 2, lines 8-9 and lines 54-56);

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- b. Provides a method to check contiguous subpatterns of data and determines if the difference between two pieces of data meet a set threshold (col. 10, lines 57-64 and Fig. 2A) and threshold levels can be set using a parameter "r" (col. 7, lines 18-21);
- c. Indices used for two dimensional analysis of data arrays (col. 12, lines 1-42) and where a zero indicates no relationship;
- d. A way to cross-correlate financial data, such as stocks against other stocks, indices, or other types of indicators (col. 39, lines 63-67). Also presented is an auto-correlogram (col. 38, lines 11-16 and Fig. 18E). Since Pincus allows for cross-correlation of financial data and an auto-correlogram, he would have been capable of creating a cross-correlogram.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to consider analyzing different time periods of a financial instrument and provide a cross-correlogram motivated by the fact that this would be an added portfolio analysis and Melnikoff's goal was to provide methods of evaluating portfolio risk.

20. Claims 11, 15, 31 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as combined in sections 11 and 19, above, in further view of Smith and Mosier (S. Smith and J. Mosier, "Guidelines for Designing User Interface Software," The Mitre Corporation, August, 1986, Sects. 2.4.2 and 2.4.3) and to Schwartz, et al., (T. Schwartz, et al., "Networks of Coactive Neurons in Developing Layer 1," Vol. 20, 541-552, March 1998).

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21. Regarding claims 11, 15, 31 and 35, while Melnikoff provides for correlation analysis, he does not provide for a correlation map. However, Smith and Mosier provide that discrepant data may be represented by thicker lines (2.4.3) and that scatterplots can be used to display how two variables are correlated and that curves can be superimposed on scatterplots to indicate correlations (sect. 2.4.2). Further, Schwartz, et al., provides for a correlation map (Fig. 5(A)) that links different cells together and discloses that line thickness is proportional to the value of the correlation coefficient. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to consider providing a graphical display of the data motivated by the need to provide a visual method to review the multitude of data used in analyzing different investments for a portfolio.

22. Claims 13 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as combined in sections 11 and 19, above, in further view of Rydén, et al., (T. Rydén, T. Teräsvirta and S. Asbrink, "Stylized Facts of Daily Return Series and the Hidden Markov Model," J. Appl. Econ. 13, 217-244, 1998).

23. Regarding claims 13 and 33, while Melnikoff and Pincus provide for different models to evaluate investment instruments, and Pincus even mentions that data could be modeled using a Markov process (col. 28, lines 25-28), they do not disclose a hidden Markov model to evaluate data. However, Rydén, et al., provides for analysis of stock data using the hidden Markov model. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to consider a hidden Markov model for

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analysis of investment instrument data motivated by the difficulty and need in understanding relationships between investment instruments and between investments and investment indices.

24. Claims 16-19 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as combined in sections 11 and 19, above.

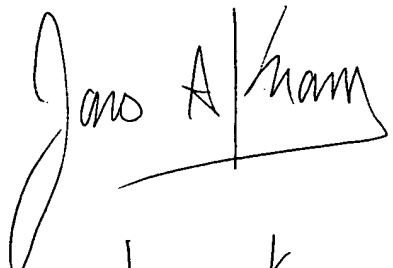
25. Regarding claims 16-19 and 36-39, singular valued decomposition provides a system and method of correlating and visually displaying data, already argued above.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth L. Bartley whose telephone number is (571) 272-5230. The examiner can normally be reached on Monday through Friday, 8:00 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Kramer can be reached on (571) 272-6783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 12/29/06
James Kramer